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DEVELOPMENT OF CERTAIN BRITISH VETERINARY SERVICES OVERSEAS

THE VETERINARY HISTORY OF SOUTHERN RHODESIA

The veterinary history of Southern Rhodesia is one of which the profession may well be proud. It is the history of a struggle against overwhelming odds by a mere handful of veterinarians whose task was rendered all the more difficult by reason of the fact that they were working in a vast and almost primitive area against numerous diseases some of which presented unusual features under new conditions and others entirely unknown to science. So numerous and devastating were these diseases during the past 50 years and so rapid their passage through the country, that it is safe to say that but for the efforts of the veterinary services Southern Rhodesia might have reverted to the state of barbarism in which the white man found it, or have become a liability rather than an asset to the British Empire of which it has become a self-governing and self-supporting member.

When in 1890 the British South Africa Company decided to develop the concessions which it had obtained from the Matabele chief Lobengula, it sent into Mashonaland a force consisting of pioneers, police and a few selected parties of prospectors, which arrived at the kopje now named Salisbury on September 12th and took formal possession of Mashonaland in the name of Queen Victoria. The pioneers were then discharged and they dispersed over the country to commence the development of their mining claims and farms. Although at that time some two-thirds of the country were infested by tsetse fly, and ticks of many species were ubiquitous, the natives are said to have owned vast herds of cattle, and the country was enthusiastically proclaimed to be pre-eminently suitable for stock raising. But scarcely had the settlers commenced to stock their farms when rinderpest, travelling down from Central and East Africa, arrived at Bulawayo in March, 1896, and spread so rapidly that in less than three weeks it had reached Mafeking and soon invaded the Cape Colony. It was only arrested in 1898, when as the result of the researches of Koch, Edington, Kolle, Turner and Theiler, the simultaneous injection of hyperimmunised serum and virulent blood with the object of conferring immunity was evolved. It is estimated that by that time some half a million of cattle in Southern Rhodesia alone had succumbed to the disease.

It was the invasion of the country by rinderpest which lead to the appointment of Mr. C. E. Gray as Government Veterinary Surgeon. It is interesting to note that at the time this "great little man" as he has affectionately been described, was working as a telegraphist at Victoria although a fully qualified and most efficient veterinary surgeon. It was he who founded the Veterinary Department of Southern Rhodesia. In February, 1897, a Veterinary Surgeon for Matabeleland was appointed and in 1899, the veterinary staff was increased to cope with an outbreak of glanders resulting from the Boer war. In June, 1901, the veterinary services of Mashonaland and Matabeleland were amalgamated and Gray was appointed Chief Veterinary Surgeon for the whole territory. In March, 1905, however, he succeeded the late Sir Stewart Stockman as Principal Veterinary Officer to the Transvaal and Mr. J. M. Sinclair was appointed in his stead. This popular and essentially tactful officer retained the position of Chief Veterinary Surgeon until 1933, when he reached the age of retirement, and was followed by Mr. G. C. Hooper-Sharpe whose early death in 1938 led to the appointment of Mr. B. A. Myhill, who is now the Chief Veterinary Surgeon.

With regard to the Research side, in 1905, Mr. L. E. W. Bevan, returning with Mr. Gray, who had been attending a post-graduate course at the Royal Veterinary College, London, was appointed a District Veterinary Surgeon. In 1909, he was granted the title of Veterinary Bacteriologist, but it was not until 1916 that, as the result of the constant demands of the farming community, a beginning was made towards the establishment of a Veterinary Research Station which was ultimately completed in 1922 at a cost of £23,000. Bevan remained as Director of Veterinary Research until 1933, when he reached retiring age and Mr. D. Lawrence succeeded him.

At the beginning of the century the veterinary staff consisted of eight qualified veterinary surgeons and six lay cattle inspectors; in 1924, the establishment consisted of 13 veterinary surgeons and 51 cattle inspectors, and according to the Annual Report of the Chief Veterinary Surgeon for the year 1938, the present number includes 12 veterinary surgeons, of whom three are detailed for meat inspection duties, and about 60 cattle inspectors. In special circumstances the police and officials of the Native Department give temporary assistance.

No sooner was the Veterinary Department established than it found its hands extremely full. Rinderpest having been arrested by inoculation, contagious bovine pleuro-pneumonia was introduced from the south and proved a very difficult disease to cope with. In 1901, another devastating epizootic was introduced

in cattle from German East Africa, in the form of East Coast fever. During the first two years of this disease nearly half the European-owned cattle died.

The then mysterious infection continued to spread until the researches of Koch, Theiler, Lounsbury and Gonder resulted in the recognition of *T. parva* as the causal organism and the demonstration of its life cycle in various species of ticks. It was not until 1909 that Watkins-Pitchford introduced the system of short-interval dipping based upon the scientific data acquired, and his method of dealing with the disease is adopted even at the present time. To-day, there are over three thousand dipping tanks in European and native areas throughout the country.

The study of East Coast fever revealed the presence of other tick-borne infections such as piroplasmosis of cattle, dogs and horses, and anaplasmosis of cattle. The introduction of trypan-blue by Nuttall and Hadwen proved of great value in the treatment of certain of the piroplasm infections but no therapeutic remedy could be found for anaplasmosis. Indigenous cattle of the country carried in their blood both parasites and they had become tolerant to them, but when these were transmitted by ticks to imported stock they gave rise to the diseases locally known as red-water and gall-sickness in virulent forms, so that the majority of well-bred animals imported for the improvement of the local stock died within a few weeks of arrival from natural infection. This greatly impeded the development of the cattle industry. In 1909, Bevan devised a method of protective inoculation, using the blood of calves from native cows which contained both parasites but which, when introduced into imported animals produced comparatively mild reactions, recovery from which rendered them immune. In 1911, this method was applied to about 60 well-bred bulls and heifers which formed the nucleus of many of the improved herds in the country. Later when systematic dipping had removed the ticks from farms so that cattle born and bred upon them grew up susceptible to the parasites concerned, this inoculation process was applied to the calves " at heel " to render them immune when moved later to tick-infested veld.

In 1931, foot-and-mouth disease was introduced from Portuguese East Africa and being of low virulence escaped detection until it had spread far and wide throughout the territory. The absence of marked clinical manifestations rendered it difficult to diagnose and control by administrative measures. The mortality was negligible but the severe restrictions placed upon Rhodesian products in transit through neighbouring territories threatened to ruin the agricultural industry. In December of that year Bevan introduced a method of intra-nasal inoculation based upon the local characteristics of the disease, and this method and modifications of it were subsequently applied to seven million head of cattle in Southern and Northern Rhodesia and Bechuanaland, and eventually eliminated infection.

Among textbook diseases which presented unusual symptoms under new conditions, may be mentioned quarter-evil which was first detected in 1911, in the Insiza district from whence it spread in all directions almost as an epizootic. Old cattle of 15 years and calves of 15 days were known to die of it. By 1919, practically every district in the territory was involved. A suitable vaccine was eventually elaborated at the laboratory and the disease was brought under control. In 1914, the presence of bovine contagious abortion was diagnosed in a herd of cattle imported from Northern Rhodesia, but the disease may have existed in the territory before that date. Within a few years of its discovery it was found to be prevalent in most parts of the country and caused serious losses especially in ranch herds. In 1921, many cases of a mysterious disease in human beings were admitted to hospitals throughout the country, and Bevan, struck by the fact that many of them came from farms where bovine abortion disease existed, found that milk from cattle suffering from that disease was infective to man. Until 1913, African horse sickness decimated horses and mules every rainy season, and in the pre-motor car days seriously impeded the development of the country. In that year a method of inoculation of horses and mules was introduced by the laboratory which during the following years reduced to less than 10 per cent. a mortality which previously had been from 75 to 90 per cent. This method was applied until 1933, when it was superseded by the neurotropic vaccine method produced by the Onderstepoort workers. In 1909, the antimony treatment of Nagana in cattle (*T. congolense v. pecorum*) infection considerably reduced the losses from trypanosomiasis.

These and numerous other diseases were successfully overcome by the practical application of veterinary science in Southern Rhodesia and this has enabled her to reach her present state of prosperity of which the following figures bear witness. In the year 1938, she imported from British countries goods to the value of seven million pounds and exported products to the value of eleven million. These latter included gold and minerals to the value of seven and a half million pounds, tobacco to the value of one million pounds and maize valued at sixty-four thousand pounds; meat and hides valued at over a quarter of a million pounds, and many other products which at the present time are proving helpful to Great Britain in her hour of need. And it is, therefore, fair to say that but for the efforts of the veterinary services throughout her chequered career, this now prosperous country could not have achieved so remarkable a measure of success.

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HISTORY OF THE VETERINARY DEPARTMENT, NORTHERN RHODESIA

The first veterinarian to work in Northern Rhodesia was A. J. Lane, Esq., M.R.C.V.S., who joined the old North-Eastern Rhodesia Administration of the British South Africa Company in 1907. In 1910, he was moved to North-Western Rhodesia, where the future Northern Rhodesian Administration was about to be established. Shortly afterwards three veterinary officers were appointed and thereafter, for some years, there were six veterinary officers in the Department. Stock inspectors were usually casually employed as emergencies arose.

The only established station of the Department was its headquarters, at Livingstone. The veterinary officers lived in tents and their duties were of a more or less nomadic nature, there being no organised veterinary districts and the administrative districts themselves being in a state of flux. A veterinary officer, however, was stationed at Fort Jameson from 1915 to 1933.

Captain F. E. Jones, M.R.C.V.S., who served as a veterinary officer from 1913 to 1916, in reporting upon this period of the history of the Department, states: "The duties of veterinary officers in these days were legion. All veterinary officers were created Justices of the Peace and were called upon to take sworn statements, arrest wrong-doers of all descriptions, act as police officers and as arbitrators in petty disputes among the natives. I had to take on dentistry and medical work and, indeed, performed many minor operations and even some that could be described as major ones. For instance, I, on one occasion, amputated a native woman's arm which had been terribly mangled by a crocodile. I was called upon to perform many obstetrical operations on native women and on five occasions had to perform the medical officer's duties at the births of European children, owing to there being no medical officer available."

The European farming community before, and during, the war years was small. There was, however, a substantial number of cattle-traders operating in the Batoka, Namwala and Barotse districts. The native community was not always easy to deal with and particularly objected to censuses of their stock being taken.

The principal diseases of stock dealt with by the Department at that time were anthrax, in the Namwala District; sheep scab in the Batoka District; trypanosomiasis in the Fort Jameson District, contagious bovine pleuro-pneumonia in Barotseland and further details of which are appended to this article; later the disease was found in the Kalomo and Senkobo Districts.

In 1913, a quarantine station and inoculation camp was erected at Maramba, near Livingstone, and an initial batch of 49 pure-bred bulls of various improved breeds—mostly Herefords—was imported direct from the United Kingdom. An attempt was made to immunise these animals against piroplasmosis and anaplasmosis by inoculating them first with attenuated strains of the parasites, obtained from the Union of South Africa, followed by inoculation of local strains of virulent blood. The immunisation was a success in so far as the two diseases mentioned were concerned but all the bulls succumbed, within a short period of their discharge from the inoculation camp, to a variety of diseases, mostly to a form of posterior paralysis.

Staffing.—Late in 1921, Captain John Smith, O.B.E., M.R.C.V.S., D.V.H., took over control of the Veterinary Department from Mr. Lane. At this time district veterinary officers were stationed at Livingstone, Mazabuka, Lusaka, Fort Jameson and Mongu. In 1927, Choma was opened as a district veterinary officers' station. It was closed in 1932 and re-opened in 1936.

Stock inspectors were stationed, with district veterinary officers, at Mazabuka and Lusaka, and independent stock inspectors at Nteko Camp, Isoka (later moved to Abercorn), Kalomo and Namwala. There were also stock inspectors in charge of the quarantine areas at Maramba and Kazungula.

In 1923 a veterinary field experimental station was opened at Chilanga, use being made of buildings relinquished by the district staff on the transfer of the Boma to Lusaka. This station was staffed by a veterinary research officer, who was later given the assistance of a stock inspector. The station was meagrely equipped and financed and little more than elementary field experimentation was possible. It constituted, however, the nucleus of the present veterinary research establishment at the Central Research Station, Mazabuka.

There are now eleven veterinary officers and 25 stock inspectors in the department, under the Director of Veterinary Services, Captain J. P. A. Morris, J.P., M.R.C.V.S., who, joining the North Rhodesian Government Service 20 years ago, succeeded Captain John Smith on his retirement in 1933.

Economics.—During recent years, the Department has interested itself to a very great extent in the economic aspects of the pastoral industries of the territory. The problems involved in the marketing of cattle, pigs, sheep, eggs, hides, butter, milk, etc., have received attention, with, in many cases, beneficial results. Much, however, remains to be done in connection with the development of improved trade in the products of the various branches of stock-raising.

Northern Rhodesia is spared some of the more serious of the diseases that take serious toll in adjacent African territories. The Department has its special problems and can claim that it has met them successfully.

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Contagious Bovine Pleuro-pneumonia in Barotseland*

Prior to 1915, Barotseland had proved a fertile reservoir for the best type of African cattle. The people had cattle sense and were comparatively intelligent pastoralists. They were not unwilling to trade, and Barotse cattle formed the foundation stock of many of the herds in Southern Rhodesia and in the European farming areas of North-Western-Rhodesia. The subsequent degeneration of the "Barotse type" beast in these areas is a matter of regret to all concerned.

Contagious bovine pleuro-pneumonia was introduced into Barotseland from Angola in 1915 by the medium of transport oxen employed in connection with an Angola-Portuguese Boundary Commission. As is usual in the invasion of a clean territory by an epizootic, the rate of spread of the disease was extremely rapid. The native community, being unfamiliar with the nature and symptoms of the disease, were entirely unappreciative of the disastrous nature of the situation. Barotseland had always been a healthy cattle country and intensive veterinary control had never been considered necessary. At the outbreak of the war of 1914-18, the veterinary officer stationed at Mongu had been withdrawn and posted to join the military forces operating on the Tanganyika border and there was complete absence of veterinary staff in the province. Owing to war conditions, too, administrative and police control were quite inadequate.

The export trade in Barotse cattle was then at its height and European traders were handling large numbers of cattle. These men, finding cattle dying on their hands, rushed their herds towards the railway line at Senkobo, where cattle sales were then conducted. This movement accelerated the spread of the infection. Sick animals, no longer able to travel,

*Extracted from a report by the Chief Veterinary Officer, Northern Rhodesia.

were left behind at various native villages, where they constituted fresh foci of infection.*

The disease thus reached the settled areas of the Batoka Province within a very short time. Here, the most rigorous control measures were put into effect by the Veterinary Department, and these proved to be singularly successful in arresting the further spread of the disease.

An inoculation campaign following the trade route back towards the Barotse border was put into effect and the disease was driven back within the boundary of the Sesheke District.

In the meantime an inoculation scheme had been commenced in Barotseland itself. It must regretfully be stated that the scheme was thoroughly unsound from its inception. No professional officers were available and the casual lay staff employed was undisciplined and incompetent. Aseptic precautions were unthought of and the after-care of inoculated animals was neglected, with the result that the virus inoculation was responsible for an enormous mortality. As the drastic effects of inoculation manifested themselves the Barotse people became greatly alarmed. Cessation of operations was demanded and the scheme was abandoned.

It is not surprising that the confidence of the native was completely lost and that, to this day, he views any veterinary measures with the deepest suspicion.

In 1918, as a result of economic pressure, virus inoculated cattle from Barotseland were quarantined at the Machili River and thence removed to Livingstone for slaughter and for export to the Belgian Congo. Originating from illicit movement in connection with this traffic, an outbreak of pleuro-pneumonia occurred in the vicinity of Livingstone in 1920. This was controlled and eradicated by June, 1921. In this connection it may be mentioned that the ultimate eradication of this outbreak was effected by a policy of slaughter and immediate re-stocking.

The Barotse-Namwala Cattle Cordon was inaugurated towards the end of 1922. Since then there has been no recrudescence of the disease in the territory outside Barotseland.

In recent years an ambitious vaccination programme has been carried out with good results.

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GOLD COAST DEPARTMENT OF ANIMAL HEALTH

In 1909, Mr. W. P. B. Beal was appointed as veterinary officer and attached to the Medical Department. In the earlier stages of his service, he was engaged in surveying the livestock of the country and their more important diseases. Attempts were made to improve the quality of the native cattle by the introduction of breeding stock of European breeds, but the results were not satisfactory.

Mr. Beal was seconded to the Royal Army Veterinary Corps during the war of 1914-1918 and returned to the Gold Coast at its termination. At this time, a renaissance in colonial administration caused development of agricultural and veterinary activities throughout the colonies. Mr. Beal made a survey of the Northern Territories, the main livestock-producing part of the Gold Coast, and drew up comprehensive proposals to Government concerning both the control of epizootic disease and improvement of the livestock of the colony. The department was made independent under the Principal Veterinary Officer and four Veterinary Officers and two European Inspectors of Livestock were appointed. An Indian veterinary graduate was appointed Veterinary Superintendent in charge of a small training school to train African assistants for the department. The headquarters of the department was moved from Kumasi in the forest to Tamale in the middle of the Northern Territories livestock area.

Unfortunately, a year after the constitution of the department there was an economic crisis; cuts and reductions were made and the veterinary programme was reduced on its disease control side, two veterinary officers being retrenched, but the animal husbandry branch remained with its two stock inspectors. Frontier quarantine stations were introduced with concomitant legalised livestock routes through the Gold Coast. Much excellent animal improvement work was done at the Tamale stock farm, not only with cattle but with sheep.

With the reduced veterinary staff the important killing diseases could not be brought under control and some years of campaigning were necessary before sanction was given for the requisite staff to deal with the question. Rinderpest and contagious bovine pleuro-pneumonia caused very heavy losses.

Before retirement, Mr. Beal drew up a comprehensive scheme of disease control with a large laboratory at Pong-Tamale, some 20 miles north of Tamale, the headquarters station of the Northern Territories.

Mr. J. L. Stewart, M.C., M.R.C.V.S., B.Sc. (Edin.), was appointed Principal Veterinary Officer in 1930 when Mr. Beal retired. The department was formed into the Department of Animal Health in 1931, and Mr. Stewart's designation was changed to Director of Veterinary Services in 1932.

The laboratory at Pong Tamale was built and is now producing anti-rinderpest serum and pleuro-pneumonia vaccine in quantity. All the cattle of the country were immunised against rinderpest by the sero-virus method and the young two-year-old cattle are immunised annually at district immunisation camps. Peripatetic African Veterinary Assistants supervised by the veterinary officers travel the country vaccinating the herds in their own habitat against pleuro-pneumonia. Both these diseases are under control.

Vast strides have been made in tsetse eradication while the animal husbandry schemes have been elaborated and there is now a centre of animal husbandry and livestock improvement in the shape of the large Pong-Tamale farm with over two dozen Native Administration cattle farms throughout the Northern Territories, all producing improved cattle in the shape of communal bulls. Nor has the development of the smaller livestock been neglected as there are flourishing pig and poultry branches which have improved the indigenous animals and birds of the Gold Coast. A departmental farm is being built in the coastal area to deal with the improvement of livestock in that part of the territory.

*This is an outstanding example of the importance of a veterinary department. Readers should note that the alarming spread followed the withdrawal of veterinary supervision of the area.

VETERINARY ORGANISATION IN BRITISH SOMALILAND

There was no Veterinary Department until the late Major T. A. B. Cocksedge, M.R.C.V.S. was appointed in 1924 on transfer from Uganda. Veterinary officers had, however, served in Somaliland—Mr. W. Adams and Mr. A. S. Leese, the authority on camels. Mr. Leese came in 1916-17 with the Somaliland Remount Commission as Camel Purchasing Officer.

During his ten years' stay Major Cocksedge built up a small but well-equipped veterinary department and started a pony stud farm. The military ponies in Somaliland now show the good results derived from the stud farm. In 1934 the Veterinary and Agricultural Departments were combined under the charge of Mr. E. F. Peck, M.R.C.V.S., B.V.Sc. (TOR.), D.T.V.M. (EDIN.), and, as in Major Cocksedge's time, the veterinary care of the Somaliland Camel Corps animals was the responsibility of the veterinary department.

This small and young department has much to its credit. Valuable observations have been made on certain disease conditions peculiar to animals, particularly camels, working in the special conditions of the country.

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VETERINARY SERVICES IN FIJI

It appears that the first veterinary appointment in this Colony was that of Mr. W. T. Collins, M.R.C.V.S., who was appointed Veterinary Surgeon in 1907. Mr. Collins remained in this appointment until 1910 when he resigned and was succeeded by Mr. L. P. Edward, M.R.C.V.S. Mr. Edward left in 1916 on war service and did not return to the Colony. The next appointment was that of Mr. G. Broom, M.R.C.V.S., on June 12th, 1917. This officer was apparently on loan from the New Zealand Department of Agriculture. He returned to New Zealand in 1918.

The three officers referred to above were attached to the Medical Department. They appear to have had no subordinate staff and no departmental record is obtainable concerning their work.

For a time towards the close of the war, the Colony was without a veterinary surgeon.

In 1919, Colonel J. Wakefield Rainey, C.B.E., F.R.C.V.S., was appointed Veterinary Surgeon. He retired in 1920 and was succeeded by Mr. Michael John Reidy, M.R.C.V.S., who also retired, and Mr. A. McKenzie, M.R.C.V.S. was loaned to the Department of Agriculture from New Zealand for a few months in 1922. The last three officers mentioned were attached to the Agricultural Department. They also appear to have had no subordinate staff and again with the exception of articles in the *Fiji Agricultural Circular* by Colonel Rainey, little record is left of their work.

The following have served as veterinary officers: Mr. W. A. Carr Fraser, B.V.Sc. (1925-27), Mr. W. G. Bennet, B.V.Sc. (1926-28), Mr. T. T. McGrath, M.R.C.V.S. (1927-28), and Mr. H. M. Stutchbery, B.V.Sc. (1928-38).

On January 24th, 1923, the present Senior Veterinary Officer, Mr. C. R. Turbet, B.V.Sc., M.R.C.V.S., was appointed: there were no other veterinary surgeons in the Colony at that time.

In addition to the Senior Veterinary Officer, the present staff consists of Messrs. H. T. B. Hall, B.V.Sc. and R. N. Sanders, B.V.Sc.

The Senior Veterinary Officer is Veterinary Adviser to the Government of Fiji and to the High Commissioner of the Western Pacific.

Since 1923, the veterinary service of the Colony has been continuously maintained and developed as a division of the Department of Agriculture. The Veterinary Division administers the Stock Improvement Ordinance, Contagious Diseases (Animals) Ordinance and Animals Importation Ordinance. In addition advice is given in relation to certain aspects of public health, brands, transport of cattle and trespass ordinances. An important function of the division is the instruction of peasant farmers in animal husbandry. Pasture improvement is also undertaken by the Veterinary Division.

There are no private veterinary practitioners in Fiji and treatment of animals for disease and injury is done by the Government Veterinary staff. Two clinics are maintained. Private practice is not allowed.

Disease incidence amongst animals is low. No acute infectious diseases of the larger animals occur. Diseases affecting cattle are mainly of a chronic nature, the principal being tuberculosis, contagious abortion and nutritional and parasitic diseases. In the horse, nutritional diseases and parasitism are the chief ailments. The same remarks apply to sheep, and goats. Filariasis occurs in practically all dogs. Distemper occasionally causes high mortality but long periods elapse during which the disease is not observed. Poultry suffer from numerous diseases including several of the classical acute infections. The control of tuberculosis of cattle, which is of high incidence, must be considered the most important economic work.

Although the veterinary division is responsible for the health of cows in registered dairies and for the economic development of the dairying industry, the Medical Department controls the registration and sanitation of dairies. The latter department also controls slaughterhouses and meat inspection.

(*To be continued.*)

BRITISH COUNCIL BOOKLETS

The British Council has issued a series of booklets on British Life and Thought which have been specially written by experts. Each book is complete in itself and the series provides a unique account of the life and work, ideas and ideals of Britain to-day. The first ten booklets deal with The British Commonwealth, The British System of Government, British Justice, British Education, The Face of Britain, British Sports and Games, British Ships and Seamen, British Aviation, The Englishwoman, The Englishman.

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THE VETERINARY RECORD.
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THE DEVELOPMENT OF OVERSEAS VETERINARY SERVICES

IN this issue we begin a series of articles on the history of overseas veterinary services. The first of the departments dealt with is that of Southern Rhodesia, and those who read the account of that service will realise how much has been done. The others concern certain colonial veterinary services.

The histories of the colonial veterinary departments will give readers some idea of the growth of a service which is now of no little importance in the progress of our colonial empire. In the beginning one or more veterinary surgeons were engaged to deal with certain diseases of stock, usually of the major variety. Some of these officers were attached to agricultural departments, some to the medical staffs, whilst others formed the nucleus of a new department.

The tasks with which they were faced were, in the majority of cases, of a formidable nature. Large tracts of land, vast herds of poor stock, unenlightened and often nomadic owners, insufficient grazing owing to the long seasonal droughts and inadequate equipment, made the possibility of disease eradication or control appear to be almost hopeless. Nevertheless, really spectacular success has, in the course of years, resulted in some cases. This has often been due to the progress of veterinary research resulting in many prophylactic sera and vaccines becoming available. In other cases, the success has been anything but spectacular. It has needed years of long and patient effort to gain even a modicum of control and the struggle still goes on. Only those who have actually been engaged in the work realise what the effort has meant.

The duties of the veterinary departments have by no means been confined to disease problems. If the results of control are to be of real worth, efforts must be made to advance the economic possibilities of the healthy animals. None of our colonies has yet reached the stage when the cattle are fit to compete in the world's meat markets. The greatest effort has been in connection with by-products. The hide and skin trade has now become of great economic value in certain colonies and high-class book-binding leather has been put on the market in large quantities in addition to that for more prosaic purposes. Dairy products, usually commencing by the manufacture of ghee (clarified butter) are steadily increasing and pig breeding, as a valuable adjunct, is now being encouraged. Egg production is still mainly a local industry but is increasing. In many cases, the departments have been actively concerned in finding markets for the produce.

A very important aspect of the work of the colonial veterinary officer lies in the education which is necessary to raise the general standard of management of stock of all kinds. Without it, real progress is impossible. Accompanying this is a policy of selection of indigenous animals to form the basis of future breed improvement. This latter must, to a great extent, await the bettering of the pastures; a very difficult task indeed. The production of herds of improved and pure bred stock has been possible under European supervision and the original breeding stock were often imported, and their numbers increased, by the department. In one colony, experimental work has been followed by the use of artificial insemination upon an appreciable scale and the subject has aroused interest elsewhere.

The foregoing gives some little impression of the work of the colonial veterinary service, for it is now a unified one and officers can be transferred, usually on promotion, to any part. Although few of the staffs have been maintained at a sufficient level, the progress made is such that those responsible may well feel some justifiable pride. There is, however, much to do and men of energy and foresight will be required. The prospects are slowly but steadily improving and we sincerely hope that men of the right sort will come forward in the future to carry on work the foundation of which has been so well laid.

RESEARCH ON WOUND HEALING

The Lancet in a recent issue pointed out that as the speed at which a wound heals depends on a large number of variables (including site, extent, depth, and degree of raggedness, the apposition of the divided tissues and the factor of infection), the assessment of claims made for substances or methods which accelerate healing presents considerable difficulty. "The vast majority of claims," states the *Lancet*, "rest on clinical impression, which has a tendency to develop into personal preference, and the way in which fashions change and recur as to antiseptics, dressings, irrigation or other treatment of wounds is some indication of the complexity of the problem. When war broke out it was decided at the Strangeways Research Laboratory at Cambridge to replace most of the purely academic work by studies of wound healing and to test on animals the various new methods of treatment which are being tried clinically. In addition, investigations are being made into the biological mechanism by which successful methods act. The essential preliminary to such experimental work was the elaboration of a method for producing and measuring standard wounds in lower animals, and this has been done. Otherwise only preliminary results were available when the report for 1939 was published. Experiments at the laboratory have, however, confirmed the beneficial action of urea on wounds which involve muscular tissue. The work being done should provide valuable information for the committee on wound healing that has been set up by the Medical Research Council."

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Fines totalling £15 were imposed on several Stewartry farmers at Castle Douglas. All pleaded guilty to failing to notify the authorities of outbreaks of swine fever on their respective farms and failing to record the movements of stock.

ABSTRACTS

[THE RELATION BETWEEN SKIN MEASUREMENTS AND THE CHARACTER OF THE SWELLING IN ELEVEN HUNDRED DOUBLE INTRADERMAL TUBERCULIN TESTS. Rider, J. R. (1940.) *Vet. J.* **96**. 154-159. (2 tabs.).]

It is, at present, the generally accepted view that the character of the swelling in a tuberculin reaction is the essential criterion by which the result should be judged, but, according to the writer, this view takes little or no account of the increase in the thickness of the skin fold which can be ascertained by accurate measurement, thus leaving the decision to individual judgment. It can, he claims, be postulated that a relationship exists between skin measurements and the character of the swelling in typically negative or positive cattle. Between these, however, lies a smaller group of animals which give swellings and measurements of an atypical character. Sometimes it is impossible to assess these results accurately, although a further test may give a typically negative or positive reaction, or may yield still another indefinite result.

The results of over eleven hundred tests performed mainly in herds qualifying for attestation are reviewed and tabulated. These tests were made at the neck site, and Camden Town tuberculin of various batches was used. Considerable importance is attached to the technique of the test which should be so standardised that every step in the procedure becomes automatic in practice. The syringe used in the tests was a 1 c.c. dental pattern with rubber piston, with an interchangeable dental needle, No. 16, $\frac{7}{8}$ inch long, which, when fitted to the nozzle projects 6 mm. beyond the mount. The fine needle caused the minimum of traumatic injury to the skin and provoked little resistance from the animal. Calipers of a rigid and accurate type were regarded as indispensable and a screw micrometer gauge reading to 0·01 mm. rendered it possible to repeat measurements with an error of less than 0·5 mm. It is stated that the common bow caliper reading only to 2 mm. is quite unsuitable.

The orthodox neck site was used and an area of skin of uniform texture selected, free from irregularities due to repeated tests. An interval of at least four months was allowed to elapse before a second test on the same side of the neck was made. In interpreting the results the reading of the tests was based on the character of the swellings to conform to accepted practice, and the measurements were correlated with these findings. Swellings which displayed the character of a small discrete pea in the skin, without any diffusion, were accepted as negative, those with diffusion, *i.e.*, loss of definition at the margin of the swelling, being judged as positive.

An analysis of the eleven hundred tests so conducted, indicated that the increase in skin thickness could be correlated with the character of the swelling, the increase bearing no relation to the age or the sex of the animal. In over 90 per cent. of the cattle exhibiting swellings of the accepted negative character the increase in skin thickness did not exceed 2 mm. at the 48th hour, and the total increase did not exceed 3 mm. In 90 per cent. of the cattle exhibiting swellings of the accepted positive character the increase exceeded 3 mm. at the 48th hour, and the total increase exceeded 5 mm. An atypical group showed total increases between 3 mm. and 5 mm. This group contained animals which, it is said, might react after an interval of two to three months, and others which might remain atypical for a longer period and eventually become positive after six to nine months or more, although the majority of the atypical group reverted to the normal range at the next test. The very narrow margin upon which the interpretation of the test may depend is thus revealed.

L. E. W. B.

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[SPONTANEOUS AND EXPERIMENTAL TUBERCULOSIS IN PIGEONS, WITH SPECIAL REFERENCE TO OCULAR LESIONS. (Trans. title.) Hepding, L. (1939.) *Arb. Reichsgesundh. Amt.* **73**. 356-368.]

The author reviews the literature on the incidence of tuberculous infections of the skin of birds and draws attention to the relative frequency of occurrence of such an infection in parrots. A description of ocular lesions of three spontaneous cases in pigeons is given and cultural and pathogenicity characteristics of the strain of tubercle bacillus isolated from the lesions were determined. In all three pigeons the eyelids were thickened and there were lentil- to pea-sized yellow caseous nodes in the conjunctivae. Visceral lesions were absent.

The experimental work indicated that the infection was due to the avian type of tubercle bacillus and that the strain, exhibiting no very marked virulence for pigeons, was more pathogenic for guinea-pigs than is usual for avian tubercle bacilli.

Spontaneous cases are considered to arise as a result of smear infection or as a result of infection with dust which contains tubercle bacilli. Injuries to the conjunctiva or scarification of the skin of the eyelid was not necessary to set up infection.

Histopathological studies of the eye lesions were made.

D. R. W.

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[I.—BLOOD CHANGES AND POST-MORTEM FINDINGS FOLLOWING INTRAVENOUS INOCULATION OF SHEEP WITH CULTURE FILTRATES OF *CL. WELCHII*, TYPES A, C AND D. Gordon, W. S., Stewart, J., Holman, H. H., and Taylor, A. W. (1940.) *J. path. Bact.* **50**. 251-271; **II.—A SURVEY OF THE TYPES OF *CL. WELCHII* PRESENT IN SOIL AND IN THE INTESTINAL CONTENTS OF ANIMALS AND MAN.** Taylor, A. W., and Gordon, W. S. (1940.) *J. path. Bact.* **50**. 271-277.]

I.—The authors have compared the effects of *Cl. welchii* toxins A, C and D on sheep, paying particular attention to blood changes. There was no marked difference in the symptoms caused by the intravenous inoculation of the different toxins, except that type A caused haemoglobinuria.

Type A toxin produced a rapid fall in the numbers of red blood cells with a corresponding fall in haemoglobin, total cell volume and specific gravity. The rate of sedimentation and the red cell fragility were increased. Type C toxin appeared to have no obvious effect on the blood. Type D toxin produced a rise in the numbers of red blood cells and a corresponding increase in haemoglobin total cell volume and specific gravity. There was a decrease in sedimentation rate and a marked rise in the inorganic and organic constituents of the blood, with the exception of calcium and chloride.

Type A toxin caused anisocytosis and slight polychromasia. Lethal doses of toxins A and D caused some agranulocytosis ; toxin D also caused a reduction in the number of lymphocytes.

On *post-mortem* examination sheep killed with type A toxin showed oedema of the lungs, and colloidal deposits of haemoglobin in the renal tubules. These changes were not caused by toxins C and D. Type D toxin caused marked congestion of the liver sinusoids.

It is concluded that type A toxin causes a marked haemolytic anaemia, type D toxin an anhydraemia, and type C toxin no specific blood changes.

II.—One hundred and ninety-six strains of *Cl. welchii* were obtained from 43 samples of soil ; of these seven were of type D and the remainder type A. Of 1,147 strains obtained from the intestinal contents of man and various animals, 1,134 were type A, three type B and ten type D.

The type B strains were obtained from a wild rabbit ; of the type D strains one was isolated from a sheep, two from a bovine and seven from a domesticated rabbit. The toxin of *Cl. welchii* was demonstrated only once in 174 filtrates of intestinal contents. The sample was obtained from a rabbit acutely ill ; the toxin was type D.

The fact that *Cl. welchii* type D exists in certain soils suggests it may gain access to the intestinal tract of herbivorous animals. The authors have shown this to be the case, and certain unexplained deaths in cattle may be the result of such enterotoxaemia. This is also the case in domestic rabbits. The isolation of type B strains from a healthy wild rabbit raises the question as to whether these animals may at times aid the spread of lamb dysentery.

D. L. H.

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[STUDIES ON THE ALIMENTARY TRACT OF MERINO SHEEP IN SOUTH AFRICA. IV.—DESCRIPTION OF EXPERIMENTAL TECHNIQUE. Quin, J. I., Van der Wath, J. G., and Myburgh, S. (1938.) *Onderstepoort J.* 341-360. (14 figs., 4 graphs, num. refs.); **V.—THE MOTILITY OF THE RUMEN UNDER VARIOUS CONDITIONS.** Quin, J. I., and Van der Wath, J. G. (1938.) *Onderstepoort J.* 361-382. (27 graphs., num. refs.).]

IV.—Following their work on the process of deglutition, closure of the oesophageal groove and experimental bowel anastomosis in sheep, Quin and his co-workers of the Onderstepoort Laboratory now describe the detailed techniques whereby the predigestive fermentation of food in the forestomachs of the ruminant as a result of bacterial, infusorial and chemical action, and some of the true digestive activities in other parts of the digestive tract, were investigated.

The first measures described are the creation of bowel fistulae at different levels of the digestive tract. In this procedure it is recommended that after an ebonite fistula tube has been secured in the wall of the organ, a stab wound should be made through the skin and abdominal muscles a little distance from the original wound through which the tube is then passed. This ensures a close contact between the organ and the parietal peritoneum.

Intestinal movements were recorded by the use of a balloon inserted into the organ through the fistula ; initial pressure was regulated by means of a pressure bulb and tonometer and movements were registered on a tambour. Details of maximal and minimal pressure fluctuations were recorded by attaching this apparatus directly to the fistula tube and thus making the organ itself act as the balloon.

Samples of ingesta for chemical and bacteriological examination were obtained by inserting a glass tube into the food mass and aspirating the required amount into a splash-head bulb situated in the centre of the tube. The volume of gas liberated at constant pressure was recorded by the use of a large water manometer, and samples of gas for analysis were collected by inserting into this circuit a T-piece connected to a glass cylinder. Finally, details are given of the methods of introducing both fluid and coarse material into the rumen for their subsequent examination as to rate of passage, nature and speed of digestion and absorption. The description of these experimental techniques is illustrated by some excellent photographs.

V.—Normal ruminal movement in merino sheep varied from five to seven contractions per 5-minute period. The rate and tonus of the contractions remained fairly constant, but the magnitude of individual contractions and spacing of movements exhibited some variation. A negative pressure between contractions as great as 10 mm. H_2O is regarded as a regular feature. Feeding caused an immediate increase of movement varying from 20 to 25 contractions per 5-minute. period. It is thought that this acceleration is due more to a pharyngeal vagal reflex than to the actual filling of the stomach with food, as the contractions rapidly returned to normal when feeding was stopped. Water caused no significant change. Solutions of copper sulphate, silver nitrate and nicotine sulphate caused increase of contractions. Esmodil (Bayer) and Lentin (Merck) caused both acceleration of movement and increase of tone. Acetylcholine and potassium cyanide caused a transitory paralysis of all ruminal movement. The graphs give an excellent summary of these results.

C. W. O.

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[INHERITANCE OF PREDISPOSITION TO RENAL CALCULI IN DALMATIANS. Keeler, C. E. (1940.) *J. Amer. vet. med. Ass.* **96.** 507.]

It has long been known that pure-bred Dalmatians are unique among dogs in that metabolic degradation of the urine is halted at the uric acid stage, as in man, instead of continuing to the production of allantoin. The author collected considerable data which proved that the supposition that the characteristic was inherited was fully justified. "High uric acid" content in the urine is inherited, as an almost completely recessive, non-sex-linked unit character, dependent for its expression on the presence of a single pair of underlying genes. It is in no way associated with the gene producing the polka dot type of spotting found in Dalmatians.

In view of the fact that eleven times the normal amount of uric acid passes through the urinary apparatus of a Dalmatian it is logical to expect an increase in renal calculi. Autopsies on nine related animals revealed the presence of renal calculi in seven, and various other autopsies revealed a similar condition. The very small number of investigations made up to now makes the results quite inconclusive, but it is hoped to do further work on the subject. It is suggested that renal calculi are far more common

than is recognised, as the animals are often destroyed or die from other causes before the kidney trouble gives rise to symptoms.

A. E. K.

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[**AN INTERESTING CONJUNCTIVAL GRAFT.** Shuttleworth, A. C. (1939.) **95**. 292.]

The subject was a cross-bred terrier. A corneal wound exposing Descemet's membrane had been received during a fight. It was decided to graft from the conjunctiva. Anaesthesia was by morphine, cocaine and novocain. The conjunctiva was freed from the bulbar attachment in such a way that two flaps were formed, which when sutured, covered the surface of the eye.

The sutures, except those covering the wound, were removed in five days, those covering the wound three days later. A week later the eye was again anaesthetised and the conjunctiva, now granulating over the wound, cut from its base. The cornea, at first inflamed, cleared and the graft became level with the surrounding cornea, eventually being embodied in the cornea and becoming pigmented. Sight is good.

Illustrations are given. J. B.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 16th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.
Sept. 18th.—Meeting of the Western Counties Division, N.V.M.A., at Exeter, 2 p.m.
Sept. 20th.—Last day for Entries for Miss Aleen Cust Scholarship.
Oct. 10th.—R.C.V.S. Committee and Council Meetings.
Oct. 11th.—R.C.V.S. Committee and Council Meetings.

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National A.R.P. for Animals Committee

Urgent Message from the Chief Executive Officer

An urgent message to all Regional Veterinary Officers in the Metropolitan area was recently issued, which applies equally to all the other Verterinary Officers of N.A.R.P.A.C. The message emphasises the extreme necessity for Veterinary Officers to have their telephone manned during 24 hours so that, should their Mobile Sections be required, prompt service will be rendered. In the Metropolitan area this is more than ever necessary, and the Metropolitan Police have been instructed in the procedure to be followed in cases of emergency.

In the event of a Veterinary Officer being otherwise engaged, the police should be put in touch with neighbouring Veterinary Officers. It will be appreciated how essential it is to maintain this telephonic communication with the police in order that co-ordination of action may be taken and delay and confusion avoided.

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Interpretation to be put upon the Regulation regarding Stray Dogs

At a recent meeting of the Finance and General Purposes Sub-Committee of the National A.R.P. for Animals Committee, the Chief Executive Officer submitted a letter from the National Veterinary Medical Association asking whether the interpretation placed by a Chief Constable on Emergency Defence Regulation 25B was correct, *i.e.*, that a veterinary surgeon was bound to take in a stray dog brought to his premises, and if so, who was responsible for paying the veterinary surgeon's fee?

The sub-committee took the view that there was no obligation on a veterinary surgeon to take in a stray dog, and that in the event of air raids persons in charge of stray animals should be referred by veterinary surgeons to Animal Welfare Centres if facilities for the reception of such animals are within easy reach. The sub-committee agreed that in cases where no animal welfare centre was available and the animal was boarded by a veterinary surgeon, they would consider defraying any reasonable out-of-pocket expenses which were not recoverable from the owners.

The sub-committee also considered the question of the retention of numbers of animals at Detention Points and whether the Committee would meet the cost of boarding these animals until such time as they could be restored to their owners. The sub-committee felt, however, that this expense should be borne by the Animal Welfare Societies as part of the assistance they promised when the Committee was formed.

In practice it is probable that dogs will not be kept at Animal Posts for the full period of three days laid down in 25B, 2(*b*), but, in the absence of name and address on collar or N.A.R.P.A.C. identification disc, will be handed over to the police. It should be noted that a dog handed over to the police will require to be retained for the period of seven days' detention in accordance with Section IV of the Dogs Act, 1906.

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Casualty Reports

In forwarding casualty reports, Veterinary Officers are asked to be careful to mention the type of animals concerned, *i.e.*, they shall include dogs, cats, birds, etc., in order that the fullest possible records may be kept at headquarters.

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PERSONAL

Birth.—Lake.—On September 4th, at Ashby-de-la-Zouch Cottage Hospital, to Constance, wife of Derrick Lake, 2, Prior Park Road, Ashby-de-la-Zouch, the gift of a daughter.

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Colonial Veterinary Service.—Mr. F. B. Leech, M.R.C.V.S., has been appointed Veterinary Officer, Nyasaland.

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Major F. J. Eardley

Many of our readers will be glad to know that Major F. J. Eardley of the R.A.V.C., who was reported missing, is now known to be a prisoner of war in Germany. His address is: Major F. J. Eardley, R.A.V.C., British Prisoner of War, No. 995, Oflag, VII C., Germany.

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Lt.-Colonel A. A. Comerford, D.S.O., M.R.C.V.S.

We are now able to publish the following additional information concerning the conspicuous service which recently earned the D.S.O. for Lt.-Colonel Comerford.

In an interview with a representative of the *Bedfordshire Times and Standard*, Lt.-Colonel Comerford modestly insisted that he had "nothing to say" so far as he was concerned, and that the honour was really conferred on his "very brave men"—the 52nd Bedfordshire Yeomanry Heavy Regiment (R.A.), of which he is in command.

"They certainly deserved this honour, and it really belongs to them," he said in recounting the story of how the Regiment held the canal at St. Momelin when Belgium was invaded. "Nothing one can say does justice to the discipline, the courage, and cheerfulness of the men. You have to remember that they were supposed to be gunners, whereas they were fighting as infantry. That was why the show they put up was so wonderful. Seasoned troops could not have behaved better than they did. They had to adapt themselves to an entirely different method of fighting from that for which they were trained. If only the Regiment had been fighting with their proper weapons the men would have done some damage."

Lt.-Col. Comerford, who has been in the Bedfordshire Yeomanry since 1921 and assumed command in May last year, said that the Regiment went to France at the end of March, and for six weeks were stationed at Fleurbaix, just south of Armentieres. When Belgium was invaded they took over the policing of the roads for military movements, which were hampered all the time by refugees. They were about a week trying to establish ordered movements on the roads, and then the Regiment was ordered to move up north-west of St. Omer to the village of St. Momelin.

"We arrived on May 21st," continued Lt.-Col. Comerford, "and I was immediately instructed to send my guns back into the safety area and hold the bridges over the canal. We held the canal until May 24th in the face of heavy attacks. Then I had orders to withdraw, but this was impossible that night because the French, who were supposed to take over, had not arrived. On the next day—Saturday—there was heavy fighting in St. Momelin and by night we were practically surrounded by the Boche infantry, who were so well camouflaged that they could get quite close before we could see them.

"On the right flank 'D' Battery put up a marvellous fight and extricated themselves from a dangerous position. We were able to hold the Germans up until about one o'clock on Sunday morning, when I withdrew the Regiment, and the canal was taken later that morning from the French."

During the retreat from Dunkirk fifth-column activity was so rife that Lt.-Col. Comerford was constantly presented with problems. But the Regiment reached the beach at three o'clock in the morning of the following Tuesday, and they were all known to be in England by Saturday.

"Considering the heavy fighting and considering that we were fighting as infantry, our losses were extraordinarily low," added Lt.-Col. Comerford. "The total of casualties was 25, and on the Saturday, when the fighting was heavy all day, the French suffered more heavily than we did. Before the Saturday the fighting was spasmodic."

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R.C.V.S. OBITUARY

Golding, George Henry, 43, Christchurch Road, Bournemouth. Graduated London, April 2nd, 1884. Died September 2nd, 1940.

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GENERAL OBITUARY

Professor Sanarelli

Sanarelli, the Italian pathologist, died recently. He was born in 1865, studied under Golgi, Pettenkofer and Pasteur, and held appointments at Siena, Montevideo, Bologna and Rome. He was a Senator of Italy, and at one time Rector of the University of Rome.

His work ranged over a wide area and included studies on cholera, typhoid fever and spirochaetosis. His contribution to veterinary pathological literature is concerned mainly with the pathogenesis of anthrax. The routes of anthrax infection in animals have puzzled many workers, and it was this aspect of the disease that is associated with the name of Sanarelli. He gave large numbers of anthrax bacilli and spores to laboratory animals by the mouth and they suffered no harm for the digestive juices of animals were found to be strongly bactericidal both *in vitro* and *in vivo*. The respiratory mucous membrane of the rabbit is similarly resistant and relatively large numbers of anthrax spores were introduced into the lungs of rabbits with no ill effect.

These studies led to the conception of a latent infection in anthrax, the spores, although ingested by phagocytes, lying quiescent but developing and producing fatal results under certain non-specific disturbances. Field observations indicate the importance of this fact in explaining cases of anthrax after cutaneous injuries, disturbances in nutrition or fatigue.

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LEGAL NOTES

Alleged Negligently-Given Certificate of Soundness for a Racing Stallion

Failure of Claim for Damages

One of the most important cases in veterinary history in New Zealand was heard in the Magistrate's Court, Christchurch, New Zealand, when qualified veterinary surgeons were at variance in their opinions as to whether a racing stallion, named "Rousseau," was completely sound and fit for breeding purposes, or a monorchid. The purchaser of the horse, a South Island studmaster, claimed that a Christchurch veterinary surgeon had given a certificate of soundness negligently and asked for £223 damages. The surgeon gave a complete denial of negligence and called evidence to rebut that of the studmaster. Mr. James R. Cochrane, of Gore, South Island, was the plaintiff and Mr. Horace E. Martin, veterinary surgeon of Christchurch, the defendant.

Following are the terms of the written judgment of the Magistrate, Mr. F. F. Reid, which sets out all the relevant facts of the transaction :—

In July of 1939, the plaintiff was anxious to buy a stallion suitable as a sire of remounts and on July 29th, 1939, following on certain preliminary negotiations, telegraphed to Messrs. Pyne, Gould, Guinness, Ltd. (a Christchurch stock and station firm) as follows: "Will purchase Rousseau subject to veterinary surgeon's certificate for remount sire."

The firm instructed the defendant, who is a veterinary surgeon practising in Christchurch, and he thereupon examined "Rousseau." In accordance with the recognised practice, he made the examination as the agent or servant of the plaintiff as purchaser. On August 1st, 1939, he issued a certificate as follows: "I hereby certify that I have this day examined at the request of Pyne, Gould, Guinness, Ltd., the thoroughbred stallion 'Rousseau,' Robespierre out of Kildee, the property of L. R. C. Macfarlane, of Culverden, I find the stallion to be six years old and sound, with the exception of a slight thickening of the near fore tendon. In my opinion, the stallion is free from hereditary diseases and would be a suitable horse to breed remounts.—H. E. Martin, M.R.C.V.S."

Early in September the horse was railed to Dunedin where the plaintiff took delivery and then took the horse to his stud farm at Gore. On October 2nd, the horse was examined by two Government veterinary surgeons, in accordance with the "Remounts Subsidy Regulations, 1938," and they rejected him as a remount sire on the ground that the genital organs were defective. In the unqualified opinion of one of those witnesses, the horse is a monorchid or "rig."

On March 20th last the horse was examined by a Mr. Pierson, a veterinary surgeon, who said definitely that in his opinion there was a defect. Further evidence to the same effect was given by the plaintiff and a Mr. Lawrence, a studmaster, who examined the horse in July, 1939, with a view to purchasing it as a stallion.

Against this the defendant, who is a veterinary surgeon with many years' experience among thoroughbred horses, has sworn that he made an examination on August 1st

in the presence of a Mr. Nurse, who had been training the horse for some years and that he was most particular in his examination of the genital organs, having in mind the purpose for which he was being purchased. He states that he found two testicles in the scrotum, but one was carried very high, being pulled up by the cremaster muscle.

Evidence for the defendant was given by Colonel James Stafford, a veterinary surgeon, who examined the horse on July 14th, 1939, when the question of whether or not it should be castrated was under consideration. He says that he made a very careful examination and found the left testicle in the normal condition, but the right testicle carried very high in the scrotum. Mr. Nurse, who trained the horse during its racing career and had it under his care for over two years, was present when both the defendant and Colonel Stafford made their examinations. He furthermore states that he handled the horse and that two testicles were present in the scrotum, one always in view and the other not. All the witnesses agreed that if the right testicle had once descended into the scrotum, it must remain there.

The horse, continued the judgment, is not necessarily useless as a stallion—that is to say, whether he is a rig or not he may be capable of reproduction—but I hold that if it is established that he is a rig, then he is not suitable for the purpose for which he was required—the breeding of remounts.

To succeed in this action the plaintiff must prove negligence on the part of the defendant. The standard of skill and care required of a veterinary surgeon is the same as that required of any other professional man, that is to say, he must possess, to a reasonable extent, the amount of skill, ability and experience required for the proper practice of his profession and he must honestly and diligently exercise that skill, ability and experience.

Viewed by itself, the evidence tendered on behalf of the plaintiff would settle the issue beyond any possible doubt, but when the evidence for the defence is taken into consideration, we have the position that there is a direct conflict of expert opinion. This is not a case where the demeanour of the witnesses, either in examination or cross-examination, can assist the court. All the witnesses gave their evidence clearly and well, without any suggestion of bias; all were unshaken in cross-examination. They were all honest and emphatic in their opinions, but those opinions differ. Under those circumstances can it be said that the plaintiff has discharged the burden of proving negligence on the part of the defendant?

To do so he must satisfy the court that the defendant's certificate was given carelessly or recklessly or without proper examination. I do not think he has done so and it follows, therefore, that the plaintiff must be non-suited.

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"BRIGHTER FEEDING-STUFFS OUTLOOK"

Under the above heading the *Farmers' Weekly* of August 30th, observes: "The first official news concerning the prospects for feeding-stuffs during the coming winter was announced in London this week. Huge stores of food-stuffs already in the country, and the failure of the Nazi blockade to interfere with the importing of supplies, make the outlook very much brighter than was at one time thought possible. Thus, it is officially stated now that dairy herds will this winter receive 90 per cent. of their ordinary consumption. Fat stock and sheep will receive 75 per cent. of their average winter requirements and pigs and poultry about one-third. As to home-grown feeding-stuffs, the Ministry of Agriculture stated this week: 'The increase in fodder crops appears to be substantial and is proof of the numbers of farmers who are realising the necessity for making themselves more self-sufficient in feeding-stuffs for livestock.' At the same time, very considerable advance has been made towards the million tons of silage at which the Ministry of Agriculture are aiming as an insurance for the winter."

THE SUPPLY OF ANIMAL FEEDING-STUFFS

The statement made recently by the Minister of Agriculture that British farmers should aim at self-sufficiency in regard to their supplies of animal feeding-stuffs raises the interesting question as to whether such self-sufficiency could, in fact, actually be achieved on a nation-wide scale," writes Dr. Norman C. Wright, in *Nature* (August 24th), and continues:—

"Some two years ago I made an estimate of the total supplies of home-produced and imported feeding-stuffs available for the livestock population of the United Kingdom[1]. A recent re-examination of the feeding-stuffs position[2] has confirmed this earlier estimate. Briefly, it may be stated that the total pre-war supplies amounted to about 42 million tons of feeding-stuffs (expressed as dry food) which provided some 22 million tons of starch equivalent and 3½ million tons of protein equivalent. Roughly 60 per cent. of these nutrients were derived from British grassland, either in the form of grazing or hay, about 14 per cent. were supplied by the home production of cereals and root crops, while various by-products (such as brewer's and distiller's grains and fish and meat meals) provided a further 1 per cent. The remaining 25 per cent. had to be imported from overseas, either in the form of cereals (chiefly maize and wheat offals) or oilseed products. The volume of imported feeding-stuffs which the British farmer is urged to replace by home-grown produce may, therefore, be roughly estimated at 10 million tons, containing about 5 million tons of starch equivalent and 1 million tons of protein equivalent.

"In considering how far this feeding-stuffs gap can be closed, three salient facts must be taken into account. First, of the total home-produced nutrients, about two-thirds are obtained directly from summer grazing. Any curtailment in the volume of imported feeding-stuffs will therefore result in a relatively larger gap in the winter supplies, and any increase in home production will, in consequence, need to take the form of feeding-stuffs which are capable of conservation for winter use.

"Secondly, there are two classes of stock, pigs and poultry, which cannot utilise large quantities of coarse feeding-stuffs and which have therefore to subsist chiefly on cereals and protein-rich concentrates. Such stock are liable to be particularly badly hit by any reduction in the feeding-stuffs imports.

"Thirdly, it must also be realised that a reduction in overseas imports may not be the sole cause of a shortage of feeding-stuffs. Disorganisation of the home fishing industry has, for example, already caused a reduction of about 60,000 tons in the supplies of fish meal, while the threatened raising of the extraction rate of wheat to 85 per cent. would reduce the quantity of offals available for livestock by as much as 900,000 tons. Again, the ploughing-up campaign, while adding materially to the total food production of the country, will itself cause a reduction of between 50,000 and 100,000 tons in the supplies of protein and starch equivalent which will be available for animal feeding.

"The above facts will inevitably increase the difficulty of closing the feeding-stuffs gap. In attempting to close this gap, three lines of action are possible: first, the exploitation of new sources of supply; second, the adoption of modified feeding methods; and third, a compulsory reduction in the livestock population.

"As regards new sources of supply, a wide variety of methods has been suggested for increasing the home production of nutrients suitable for stock feeding. A recent review of these methods[3] indicates, however, that few of them are capable of making a really significent contribution towards closing the feeding-stuffs gap. For example, the more efficient utilisation of kitchen waste, which was the subject of a special article in *Nature*[4], could at best only replace about half of 1 per cent. of the pre-war imports, while improvements in the methods of conservation of slaughter-house offals might achieve an increase of about the same order. The pre-digestion of straw with alkali, the potentialities of which were explored by Germany

in the war of 1914-18, is at present the subject of intensive research in Great Britain. The object of the treatment is so to improve the nutritive value of straw now used for litter that it can usefully be fed to livestock. The treatment of, say, 10 per cent. of such straw (an optimistic estimate in introducing a very novel practice to a very conservative industry) would, however, only replace 2 per cent. of the energy content of the pre-war imported feeding-stuffs, while it would have no effect on the supply of protein.

"So far as the protein portion of feeding stuffs are concerned, the use of synthetic non-protein nitrogen compounds such as urea has been advocated as a substitute for part of the protein in the rations of ruminants. In order to make good the low protein content of cereals *in the rations of dairy cattle alone* it would, however, be necessary to envisage an output of urea of the order of 50 tons per day, a quantity which is certainly well beyond the present capacity of the country's production plant. Again, it has been suggested that, as an alternative means of making good the protein deficiency of home produced feeding-stuffs, the cultivation of protein-rich crops such as beans should be increased. This could, of course, only be done at the expense of an existing crop, say oats. If this latter fact is taken into account, even the doubling of the present bean acreage, would only increase the supply of protein equivalent by about 10,000 tons (1 per cent. of the pre-war imports), while it would simultaneously *decrease* the supplies of starch equivalent by about 16,000 tons. The same general finding applies to all other crops which have been advocated as potential sources of increased supply.

"It is clear from the above facts that most of the suggested new sources of supply, while no doubt of use on certain individual farms, cannot be expected to contribute significantly towards the closing of the feeding-stuffs gap. There remains one further source of supply which has not been discussed, namely, grass silage. The Ministry of Agriculture is clearly pinning much faith on the development of this form of conserved fodder as a means of replacing imported feeding-stuffs. The immediate aim is stated to be the production of one million tons of silage from the present season's aftermath. This would, it is true, only replace about 2 to 3 per cent. of the pre-war feeding-stuffs imports. The above figure is, however, clearly an interim one: a far greater effort would obviously be called for over a complete grazing season. In this connection it may be noted that a ten-fold increase in the present objective, that is, an annual production of ten million tons of silage, would replace about a quarter of the pre-war imports—a really substantial contribution. Although such a large output might appear somewhat impracticable, it would require the provision of only three small (30 to 40 ton) silos on every agricultural holding of more than 150 acres—an achievement which should not prove impossible in time of really serious emergency.

"It would not perhaps be out of place to mention at this point one other *indirect* method of increasing the proportion of home-produced nutrients, namely, a return to summer milk production and an intensification of summer meat production. The term 'indirect' is used because the method involves the storage of the finished products themselves (dried or condensed milk, cheese, meat, etc.), instead of the storage of the grass herbage as hay or silage. The method would entail a drastic changeover in management (for example, in re-arranging calving dates), but as a long-term measure has obvious advantages.

"Taking into account all the above sources of supply, it does not appear that they could replace more than about one-third of the pre-war imports of feeding-stuffs. For further savings it is necessary to turn to the second line of action, namely, the adoption on the farm of more economical systems of feeding.

"There is no doubt that substantial savings could be effected by this means if rationing on a basis of modern feeding standards were to be adopted on a nation-wide scale. The general tendency of recent animal-feeding experiments, whether with cattle, sheep, pigs or poultry, has been to show that the older feeding standards can be markedly reduced without adversely affecting the health or productivity of the stock. Reductions of the order of 20 per cent. may, indeed, be made in the protein and/or energy contents of most rations. Again, the methods of feeding beef cattle and sheep could well be modified under war conditions, when the provision of an *adequate quantity* of meat is more important than the attainment of *superfine quality*. Again, war-time methods of stock-feeding (for example the Lehmann system of pig-feeding) permit the use of more coarse feeding-stuffs (and therefore of more home-produced roughages) than is normally considered practicable.

"It is not easy to estimate the total savings in imported feeding-stuffs which might be effected by the widespread adoption of these various measures. A recent review[3] indicates that such savings would probably amount to nearly a quarter of a million tons of protein equivalent and to more than a million tons of starch equivalent, that is, to more than a fifth of the estimated total feeding-stuffs gap.

"New sources of supply and the more economical use of existing supplies together might therefore make good about half the pre-war imports of feeding-stuffs. The extent to which the third measure, a compulsory reduction in the livestock population, would be necessary would then clearly depend on the level at which feeding-stuffs imports could be maintained during the war period. Up to the present, the supplies which have been released by the Ministry of Food have not fallen below the 50 per cent. level, though the first preference accorded to certain classes of stock, notably milking cattle, has involved particular hardship on many breeders of pigs and poultry. If imports were to fall consistently below the 50 per cent. level, a reduction in the livestock population would be inevitable, for there is no more wasteful method of utilising feeding-stuffs than by dissipating them in the maintenance of an excessive livestock population.

"In deciding on the classes of stock to be reduced, and on the extent of such reductions, a number of factors would require to be taken into account. Among these would be the relative food values, for the human population, of the various animal products produced by each class of stock, the extent to which the imports of such animal products were themselves reduced, the relative efficiencies with which the different classes of stock could convert feeding-stuffs into human food, and finally the maximum rates of reproduction and therefore the potential rates of replacement of the depleted flocks and herds in the post-war period. Any detailed discussion of these points would, however, be outside the scope of the present article."

References

[1]Wright, N. C. (1938.) "The Importance of Home-Produced Feeding-Stuffs," *Trans. Highland and Agric. Soc.*

[2]——. (1940.) "Britain's Supplies of Feeding-Stuffs," *Empire J. Exp. Agric.*

[3]——. (1940.) "Britain's Feeding-Stuffs Gap: Can it be Closed?" *Agric. Progress* (in press).

[4]Beharrell, J. (1940.) "Kitchen Waste for Feeding Farm Stock," *Nature*. **146**. 47.

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BOVINE INFECTION IN HUMAN TUBERCULOSIS

It was pointed out in an annotation published some months ago in the *British Medical Journal* that knowledge of the part played by the bovine bacillus in tuberculosis in man is still scarce and may be misleading. "This," states the *B.M.J.*, "is because investigations in this connection are laborious and have, therefore, been carried out in few countries, and because results are not applicable even to all districts of the same country. Recent research, particularly in Great Britain and Denmark, is increasing our knowledge and has helped in demonstrating the factors that may account for the differences noted by different workers, in different districts, in different forms of tuberculosis, and at various ages. At a meeting

of the Swiss Association against Tuberculosis Dr. T. Baumann[1] presented a detailed and very useful review of the subject. The incidence of the bovine bacillus is not only greater in the tuberculosis of childhood than in that of adult life, but is greater the younger the age group. The mode of infection in children is mostly through the digestive tract as the result of drinking unboiled infected milk; but some are undoubtedly infected through the air passages by adults suffering from pulmonary tuberculosis caused by the bovine bacillus or by infected cattle. Two things are clear: the bovine bacillus is as pathogenic to man as is the human bacillus, but the different effects caused by the two types of tubercle bacillus are due to different mode of infection and not to altered virulence or a changed response by the body. In a recent paper[2] Dr. W. T. Munro, discussing the epidemiological aspects of pulmonary tuberculosis due to the bovine bacillus, bases himself on the 1,061 cases examined at the Glenlomond Sanatorium, where 50 patients were found to be infected with the bovine type, and on figures from other sources. He concludes that there appears to be no real increase in the incidence of the bovine type; that most of the cases arise from infected milk, there being a slightly higher incidence of the disease among those employed on farms than among the average rural population; that there is evidence of spread of the bovine type by human agency; and that the possibility of infection of tubercle-free herds by a person coughing up bovine tubercle bacilli cannot excluded. Munro believes that mutation of bacilli can occur, but that it will not take place in the lifetime of any one observer.

(1) *Schweiz. med Wschr.* (1939.) **69**. 233.
(2) *Edinb. med. J.* (1939.) **46**. 165.

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PREVENTION OF ADHESIONS

"Much surgical ingenuity has been expended on the prevention and cure of adhesions in various parts of the body, but it has been handicapped by lack of knowledge of why they form or why they disappear," states the *Lancet* in a recent annotation, which continues: "In the peritoneal cavity the glueing together of omentum and intestine about an infective focus, such as a perforated appendix, is secondary to the formation of a fibrinous exudate on the peritoneal surfaces, and often preserves life by localising the infection. On the other hand widespread adhesions may follow an aseptic exploratory laparotomy in which no viscus has been opened and interference has been minimal. This unfortunate occurrence is difficult to understand. Acting on the assumption that fibrin is the usual precursor of adhesions a number of attempts have been made to avoid them by using substances that are held to destroy fibrin, such as amniotic fluid and papain, but these measures have proved disappointing. Another line of attack lies in preventing the formation of fibrin. Heparin possesses such an action in the blood and has met with a greater measure of success when used in the peritoneal and pleural cavities. Lehman and Boys* have lately experimented on rabbits and dogs in which peritoneal adhesions were induced either by mechanical damage or by bacterial contamination. In the rabbits both methods were used and from three to five days later the abdomen was reopened and the adhesions divided. In one group of rabbits the abdomen was then closed without further treatment; in a second group 25 c.cm. of normal saline was left in the cavity; in a third group the same volume of amniotic fluid (Amfetin) was substituted for the saline; and in a fourth group the same volume of saline containing 750 units of heparin was used. The same amounts of these various fluids were also injected by paracentesis on the first and second days after operation. A week later the adhesions had re-formed in all the rabbits except the heparin group, in which only one rabbit out of the 20 was affected. In the dogs adhesions were produced by bacterial contamination and were divided after six weeks. The same three control groups were established, 100 c.m. of amniotic fluid being instilled in the third group and the same volume of saline containing 3,000 units of heparin in the fourth group. When reexamined a fortnight later all the control animals in the first three groups had more adhesions than before. In the heparin group, however, there were less than before. These results are encouraging, but as Lehman and Boys point out the time has not yet come for their application to human subjects. Whereas no complication of the treatment was observed in any of the rabbits, three of the 24 dogs which received heparin died from profuse intra-abdominal haemorrhage. Further experiments in which scrupulous haemostasis can be vouched for will show whether this is a risk inherent in this line of treatment.

"Another part of the body in which the control of adhesion formation is of paramount importance is the brain and its meninges. The mechanism here differs from that in the pleura and peritoneum since the exudation of fibrin plays no obvious part. Injury to the surface of the brain involves the opening up of the subarachnoid spaces and local disorganisation of the circulation of cerebro-spinal fluid. During healing the leptomeninges are replaced by a granulation tissue which unites the surface of the brain to the more superficial tissues. In time this is converted into fibrous tissue, and when the wound has involved the cerebral convexity the slow subsequent process of cicatrisation is often complicated by epilepsy. This complication is one of the bugbears of neuro-surgery and has too often marred the post-operative course of a case that should have been a complete surgical success. As experience in the last war showed, traumatic epilepsy is, too, a common sequel of gunshot wounds that perforate the dura mater. Penfield demonstrated 13 years ago that the production of epilepsy in such cases depends on the formation of a vascularised scar of connective and glial tissue through which an ever-increasing traction is exerted on the cerebrum. Evidence of this pull is seen in the displacement of the ventricular wall towards the scar, and in the inward suction of the dura over the scar when it is released at operation from the bone and adjacent structures.

"The importance of any measure that will minimise the formation of adhesions over the surface of brain wounds thus needs no emphasis. A technical investigation which appears to serve this end has just been reported by Yi-Cheng Chao, Humphreys and Penfield.† They use sheets of specially prepared amniotic membrane which they call 'Amnioplastin.' The amnion is obtained by the dissection from fresh washed human placentas. After again being washed the membrane is placed in 70 per cent. alcohol, then stretched and dried on a smooth glass plate. It is preserved either dry or in 70 per cent. alcohol until required for use, when it is autoclaved and transferred to sterile Ringer's fluid or saline. Pieces of this membrane were laid over the surface of the brain in cats after lacerating the pia or even the brain tissue itself. The bone and dura mater were not replaced, the deficiency in the skull being closed with temporal muscle. After ten days the membrane had undergone a mucoid change; above and beneath it fibroblasts had appeared, but there was no evidence of foreign-body reaction. After 30 days no naked-eye or microscopic evidence of the membrane could be found; its complete disappearance without foreign-body reaction is a remarkable observation. The dural defect had been filled in by a connective-tissue layer which was completely separated from the subjacent pia by what appeared to be a continuation of the subdural space. Animals examined after 50 and 60 days showed a similar picture: in no instance were adhesions present between the regenerated dura and the underlying brain. Penfield

*Lehman, E. P., and Boys, F., *Ann. Surg.*, March, 1940, p. 427.

†Yi-Cheng Chao, Humphreys, S., and Penfield, W., *Brit. med. J.*, March 30th, 1940, p. 517.

and his co-workers have compared the action of amnioplastin with a number of other materials which have received attention in this field in the past, including untreated human amnion, insultoic (allantoic) membrane, plain catgut membrane, fascia lata, Cellophane, sheets of various metals, fat and Cargile membrane (ox peritoneum). None of these succeeded in preventing adhesions although human amnion made them 'very mild.' The worst results were with silver foil. In the experiments on amnioplastin and insultoin the test was made more severe by cauterisation or removal of cerebral tissue down to the ventricles and the emplacement there of excised bits of muscle. The case for amnioplastin thus seems to be very strong and it has already been used in human beings at the Montreal Neurological Institute with results that so far seem beneficial. In the treatment of brain wounds careful débridement must precede the application of the membrane to the surface. During the operation the membrane is kept flat and moist between sheets of glass until required, and when lifted into place it adheres at once to the brain and is not easily dislodged. This new technique for the avoidance of adhesions after craniotomy comes at an opportune moment, and if its promise is fulfilled the method may well be extended to other surgical fields where the menace of adhesions still persists."

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ELECTRIC GOADS

Numerous references to the varied uses to which electrical devices for "coaxing" stock can, or might, be used have appeared in our columns of late. A further contribution comes from Mr. G. S. Muir, B.V.Sc., M.R.C.V.S., of Needham Market, Suffolk, who writes :—

"I am very much interested in the subject of electrical goads, since having seen them in use at the Toronto Stockyards, where they appeared to be extremely useful and humane, and a great advance upon the barbaric methods in use in this country, where one may see at any livestock market beasts of all descriptions prodded and beaten most unmercifully at unloading, when being got on to the weighbridge and again going into and out of the ring, the unhappy procession being goaded along to the complete indifference of the crowd.

"I brought the electric goad to the notice of the University of London Animal Welfare Society, now the Universities Federation for Animal Welfare, some years ago, and they have maintained their interest in the subject, as may be seen by the enclosed copy of an extract from an American humane paper, which I have just received from their General Secretary, Miss M. A. Challen, B.A. The article exposes the dangers of such devices if not properly made and their potential shock controlled. I hope that our profession will come forward in support of the use of this humane method of driving animals."

Our correspondent's enclosure is as follows :—

Electric Prods and their Abuse*

At its national convention in Milwaukee in 1937, the American Humane Association appointed a special committee to investigate the use of prods energised by electric current. No definite conclusion was reached other than the fact that the Association could not endorse any prods until it was satisfied that general construction and current output was such as to make them both harmless and effective.

In a letter addressed to me by Superintendent Walter J. Dethioff, of the Wisconsin Humane Society, it is pointed out that the committee is definitely opposed to home-made devices. He states, however, that there is a certain amount of merit in the electric prod as against the general practice of mistreating live-stock with prods and canes of various kinds.

Several manufactured makes of electric prods were referred to the School of Engineering in Milwaukee for study. Mr. Dethioff was informed that while the voltage was high the amperage was so low that it could not be measured. The two prods with which he is most familiar have dry cells with a capacity of one-and-a-half to four-and-a-half volts. With an induction coil this current can be stepped up so that the shock is very severe. It appears that local packers are in favour of electric prods if they can be constructed to cause no damage to hide or no bruised meat losses.

Of recent years, there has been a gradual increase in the use of electrical devices for prodding cattle and other live stock. At Cincinnati, where the writer is best acquainted with the situation, a recent prosecution by the S.P.C.A. brought to light some very useful information. Certain firms make electric prodding devices for retail sales. They consist in the main of a battery or batteries, a coil of the induction type and convenient electrodes for contacting the animal. Co-operating with the local S.P.C.A., we examined four such shocking prods, two of the manufactured variety and two of the home-made nature. One of these devices consisted of a cane attached by wires to a box carried over the shoulder of the operator. In the box was a B type battery and an induction coil. This device was putting out 3,080 volts with an amperage below the ordinary ammeter reading. I can personally attest that the shock given by this device was very severe and was felt for some time afterwards.

Another prod of the electric shocking variety, which was also brought to our attention, was, in the writer's opinion, even more cruel and damage-producing. It consisted of a metal case 30 inches long and 2 inches in diameter. At one end was a wooden handle with a leather thong for holding by the person using it. The other end of the tube was provided with two permanent electrodes, which were a ¼ inch in diameter, 2 inches long and, at the extreme end for a distance of ½ inch, the spike-like prongs were tapered to ⅛ inch in diameter. This prod was heavy and tired the hand to hold it—it weighed 7 lb. On the handle there was a switch for closing the circuit and producing a shocking current at the electrodes. This prod produced 3,600 volts and it was in itself so heavy that even when a mild prod was given and even without the current it had a damaging effect upon the epidermis of the animal's skin.

Two other devices which came to our attention were home-made arrangements and copied after the first-described prod. They consisted of a cane with metal electrodes in the end. The electrodes were fashioned from spikes but were bent so that only the side surface contacted the animal. From a cane a wire cable led to a wooden box carried by the operator over his shoulder. In the box was a 2-volt dry cell and an induction coil taken from the coil box of an automobile. Each of these prods produced 4,000 to 7,000 volts when tested. It was the person using one of these devices who was arrested, prosecuted and corrected in the Cincinnati court. The damage of using such prods is not apparent at first glance, but it is far-reaching and has a distinctly harmful effect upon the leather made from such damaged skins.

To determine the immediate damage of the contact between the animal's skin and such shocking devices a pig was purposely shocked (one single shock) on a marked area of the ham and within two hours the animal was slaughtered. We obtained the skin of the marked area and found a first degree burn the exact pattern of the contact electrode. Upon microscopic examination of sections through the burn, it was seen that the burn extended through the epidermis but did not involve the underlying corium. Since animals in general are more sensitive to electricity than man, there can be no question of the inhumanity concerned.

The writer further took occasion to see the use of these many different prodding devices in the hands of truckers and animal attendants at the public stockyards. Animals which were moving along with no difficulty were often urged to greater speed by the electric prods. The animals in most cases became terrified and ran wild into the fences

*Copy of article by Dr. Fred O'Flaherty appearing in the *National Humane Review*, May, 1940.

and other animals in the lot. A single pig was seen to jump a distance of 5 feet, straddling itself when it landed. Anyone who has seen the electric prod used and is acquainted with the meat damage seen on dressed carcases, can have little doubt of the extensive bruising and injury caused, not to mention the damage to the skins and hide. The instrument described above was used on a piece of hide and by letting it fall a distance of 2 feet, its own weight on the spike-like electrodes made an irreparable blemish.

That some electric device which would mildly shock an animal could be used safely and humanely is not denied. But to try and set limits of voltage which would be within humane limits is indeed difficult. With new batteries in such prods the voltage is increased to its maximum output and since the amperage is directly proportionate to the resistance this will vary with the weather and condition of the animal's skin.

A policy which is quite simple and does establish a real safety limit is to require that any operator using an electric prod have the shock of no greater intensity than he would give himself.

In instances where electric fences are used the voltage is of the magnitude of 90 to 150 volts with safety fuses to permit no more than one ampere of current to pass. Such shock is sufficient to make all animals stay away from such charged fences, so it should be ample for any shocking purpose—just compare this shock 90 to 150 volts with the 3,000 to 7,000 volts of prodding devices.

The damage to meat is a considerable factor and is a source of great economic loss to the meat industry. The damage to skins and hides is considerable, as the mechanical prod damage occurs on the very best part of the hide or skin, and when such tissues are damaged only a few hours before slaughter the damage is not repaired. The returns from hides are of high value to the livestock raiser or farmer. The average return on hides is 12 cents, or $240 per ton. An indifferent attitude is sometimes adopted, namely, that hide conditions do not affect the return received by the farmer. This is a false idea. The meat industry pays only for what it gets, based upon expected returns. The return expected from the care of cattle is definitely demonstrated at the livestock shows each year. Quality brings the best returns. Take care of the animal and it will bring a better price.

* * * * *

NEW OINTMENT BASES

"It has long been felt that the official ointment bases hallowed by inclusion in the *B.P.* and the *B.P.C.*—namely, benzoinated lard, wool-fat, and the paraffins—are by no means all that they should be in providing vehicles for the application of external medicaments," comments the *British Medical Journal* in a recent annotation, which continues: "Nor do they compare favourably in elegance with the creams, skin foods, etc., providing by the enterprising manufacturer of cosmetics. A good deal of work has been done by P. M. Mumford and others to find better and less messy ointment bases. Mumford demands from the ideal ointment base the following properties: it must act with equal efficacy on dry and oily skins, be removable with water, must suspend within itself both water-soluble and fat-soluble chemicals, transfer chemicals rapidly into the skin, be stable and neutral, and have no tendency to deprive the skin either of its natural fat or of water. It must be admitted that the cosmetic chemist has out-distanced the medical dispenser in his attempts to approach this ideal, but within the last two years something has been done by dermatologists to remove this reproach. It appears that the improvements in bases are due chiefly to the addition of substances which act as emulsifiers, saponifiers, and reducers of surface tension. There are several types of compound which act in one or other of these ways. Among them are certain derivatives of lanoline (wool-fat), certain members of the higher fatty alcohol series, notably cetyl and stearyl alcohol, and, above all, the esters of these higher alcohols—that is to say, the compounds formed by the action of sulphonic and phosphoric acid on the alcohols. These esters are neutral, stable to acid, to alkali, and to hard water, and excel soap in their emulsifying and cleansing properties. Mumford, to whom undoubtedly belongs the credit of starting the investigation of this field from the dermatological aspect, has, with the help of Messrs. Halden of Manchester, evolved a base consisting of about three-quarters liquid and soft paraffin with the remaining quarter a mixture of hexadecyl and octadecyl alcohol containing 10 per cent. phosphated esters of these alcohols. This base is on the market. It possesses to a considerable degree the characteristics postulated by Mumford for the ideal vehicle. The lanoline derivatives have long been known, and "eucerin," which consists of a mixture of the solid alcohols of the meta-cholesterol series obtained from lanoline mixed with neutral hyrocarbons, has long been a popular product. It, too, has many of the qualities of the ideal ointment base. Bamber has tested several other compounds the use of which in comparatively small quantities might improve our official ointment bases. Among these are lanette wax, which is a commercial article consisting of a mixture of partially phosphated cetyl and stearyl alcohols, which forms a neutral emulsion easily absorbed by the skin; Turkey red oil, which may with advantage be used in ointments instead of glycerin; oleyl alcohol, which is useful in hair lotions; and Avocardo pear oil, which is very rapidly absorbed by the skin. Very similar investigations have been carried out by Soulsby, who finds that a solution of methyl cellulose is a very useful constituent of an emollient cream, but that triethanolamine, although widely used in cosmetics, is not a good base because it extracts natural oil from the skin and may easily hydrolyse with other bodies. It is difficult within the limits of a short review to recommend actual formulae, but enough has been said to show that considerable attention has lately been given to the improvement of ointment bases."

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THE CELL AND PROTOPLASM

A symposium on "The Cell and Protoplasm" was convened at Stanford University, California, from June 30th to July 5th, 1939, when a series of 15 papers were read by distinguished biologists including three visitors from Europe, Prof. Szent-Györgyi of Hungary, Prof. Hugo Theorell of Sweden and Prof. J. D. Bernal of Great Britain. Among the contributions of particular interest was the paper by Prof. I. W. Bailey of Harvard University dealing with the molecular arrangement in the cellulose wall of higher plants: all evidence thus far indicates that the cellulose matrix is a continuous system of anastomosed chain-molecules, the long axis of which is oriented parallel to the long axis of the cellulose fibril. There is no evidence that randomly oriented chain-molecules form a part of the structural framework of the cellulose wall of plants. Prof. Jennings of the Johns Hopkins University dealt with the problem of material interchanges between the nucleus and cytoplasm of the cell. In the late stages of mitosis the chromosomes enlarge and become vesicular due to their acquiring material derived from the cytoplasm which subsequently becomes altered and is finally returned to the cytoplasm when the chromosome is broken down. Such cyclic interchanges and transformations apparently provide the essential mechanism of cellular differentiation. The commonly accepted gene theory of Mendelian heredity was criticised by Prof. Goldschmidt of the University of California; he considers that the gene theory should be replaced by a chromosome theory in which the occurrence of genes as discrete entities arranged bead-like in a definite order, need not be assumed. This concept ascribes to the chromosome a linear pattern, changes in which would account for mutational phenomena as compared with the idea of changes within discrete particles, or genes, of molecular order.

Dr. W. M. Stanley of the Rockefeller Institute dealt with the structure of viruses: these entities exhibit properties of organic synthesis and reproduction character-

istic of the living cell, yet appear to be beyond the limits of cellular organisation commonly understood. Their apparently complete dependence on a living cell for their reproduction would place them among obligate parasites the nutrient requirements of which are highly specific and, at present, beyond experimental duplication. Their essential nature may have a counterpart in the chromosomal genes of the nucleus or in the enzymes.

Prof. Szent-Györgyi emphasised the similarity between vitamins and enzymes, the former being identified in some cases with the prosthetic group of certain enzymes: thus vitamin B_1 is identical with the prosthetic group of the enzyme carboxylase and the anti-pellagra vitamin is identical with the nicotinic acid amide forming part of the prosthetic group of various dehydrogenases. Whether a substance is a hormone or a vitamin often depends on whether an organism can itself produce it, *e.g.*, thiamin is a vitamin for animals, a hormone in some plants and a vitamin for other plants, depending only on their powers of synthesis. These relationships give further evidence of the fundamental unity of the plant and animal kingdoms.

The colloidal properties of protoplasm were discussed by Prof. Heilbrunn of the University of Pennsylvania, who has recently demonstrated a localisation of calcium in the cortex of the cell which, on receiving the appropriate stimulus, is released within and so effects a gelation of the cytoplasm resulting in contraction. Thus the age-old problem of contractility, a common property of protoplasm, may find its explanation in the localisation and release of calcium in the cortex of the cell.

The final paper, read by Prof. Bernal of the University of London, dealt with the energy relations of protoplasm. These energies relate primarily to the protein constituents and can be studied experimentally in tobacco mosaic virus (a protein) suspended in salt solutions. Here the virus entities in the form of long protein molecules become orientated in striking spindle-like patterns, and their regular distance apart varies directly with the concentration of the salt solution.

The papers presented at the Symposium are to be published by the American Association for the Advancement of Science.—Condensed from *Nature*, November 25th, 1939, pp. 884-7.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in fo[illegible]wing Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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BOVINE TUBERCULOSIS IN THE TROPICS

To the Editor of the Veterinary Record.

Sir,—In the abstract of my paper " Bovine Tuberculosis in the Tropics, with special reference to Uganda " (*J. Comp. Path.* **52.** 322-335) in your issue of June 1st, 1940, the following paragraph occurs :—

> " It is possible that the more open-air life led by the majority of native cattle also contributes to a low incidence of tuberculosis. This is borne out by the author's observations in Uganda, etc."

I wish to point out that in the above paper there is no evidence to bear out such a statement and in my opinion the " more open-air life " has very little to do with the low incidence of tuberculosis in the tropics, for if such was the case how can it be explained why the Ankole cattle are so highly infected whilst the Zebu cattle show little or no infection since both breeds live under similar conditions ?

There is a reference quoted (Hornby, 1934) which gives the opinion that the more open-air life contributes to the low incidence of bovine tuberculosis in the tropics. This explanation, although expressing popular opinion, is in my view of minor significance and the true explanation is probably a specific racial resistance in the Zebu cattle. Evidence to support this opinion will be published shortly.

Yours faithfully,

J. Carmichael.

Veterinary Laboratory,
Entebbe, Uganda.

July 19th, 1940.

DISEASES OF ANIMALS ACTS, 1894 to 1937, and AGRICULTURE ACT of 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic § Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th Aug., 1940	17	20	5	755	—	—	6	227	175
Corresponding period in ...									
1939	17	20	—	—	—	1	7	110	95
1938	26	321	—	—	—	—	2	33	35
1937	15	17	4	827	1	1	2	34	11
Total 1st January to 15th Aug. 1940	339	387	24	3,665	15	30	124	2,764	1,899
Corresponding period in 1939	527	575	44	5,652	31	71	164	1,448	1,073
1938	561	913	157	20,261	42	70	107	410	302
1937	472	573	19	4,473	88	125	133	722	438

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.

Contents

PAGE

GENERAL ARTICLES:

Strained Tendons and their Treatment by Firing. A. C. FRASER 689

A Gas-forming and Proteolytic Variant of *Str. agalactiae* ... J. G. DAVIS and H. J. ROGERS 692

EDITORIAL:

Emergency Measures 692

CLINICAL COMMUNICATION:

Tuberculosis in a Horse ... ... A. G. FRASER 693

REVIEW:

"Drive the Dead Leaves." A novel by R. G. NETTELL 693

ABSTRACTS:

Inco-ordination of Equidae: Wobblers (Dimock, W. W., and Errington, B. J.) ... J. W. H. H. 694

Coal Tar Pitch Poisoning in Pigs (Graham, R., Hester, H. R., and Henderson, J. A.) J. B. T. 694

PAGE

Is Leucaemia a New Growth? (Annot. *Brit. med. J.*) 695

Observations on the Life-history of *Bunostomum trigonocephalum*, a Hookworm of Sheep and Goats (Ortlepp, R. J.) ... ... J. N. O. 695

Fat Metabolism in the Animal Body (Smith, J. A. B.) ... ... A. N. W. 695

NOTES AND NEWS:

Disguising Grey Ponies in Dry Climates ... 694

Record Cattle Population 694

Diary of Events 696

Personal 696

Colonial Office Appointments 696

Education in the Colonies 696

Domestic Poultry Keeping: Advisory Council Appointed 696

The National Milk Scheme 696

Ministry of Agriculture News Service 697

Ministry of Agriculture's Cropping Policy for 1941 698

Oestrogens 699

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Creosalgen, Surgical 3%	5/–	4/6
Formaldehyde 2%	6/–	5/6
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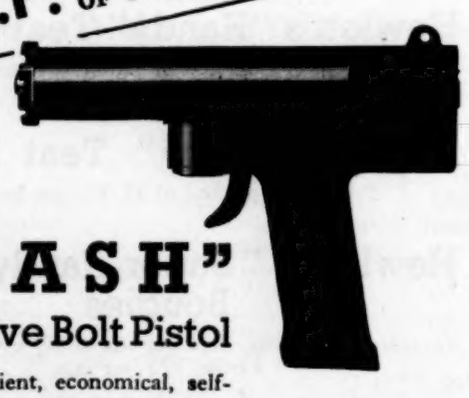

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